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# TRANSMITTAL FORM

*(to be used for all correspondence after initial filing)*

| | |
|---|---|
| Application Number | 08/914,536 |
| Filing Date | August 19, 1997 |
| First Named Inventor | STEVENSON, Michael J. |
| Group Art Unit | 1762 |
| Examiner Name | Erma C. Cameron |
| Total Number of Pages in This Submission | |
| Attorney Docket Number | STEVE-106 |

## ENCLOSURES *(check all that apply)*

- [X] Fee Transmittal Form
  - [X] Fee Attached
- [ ] Amendment / Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] After Allowance Communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [X] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [X] Other Enclosure(s) *(please identify below)*:

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Remarks

## SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

| | |
|---|---|
| Firm or Individual name | Robert E. Strauss |
| Signature | Robert E. Strauss |
| Date | Feburary 2, 2004 |

## CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231 on this date: 02/02/2004

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| Typed or printed name | Robert E. Strauss | | |
| Signature | Robert E. Strauss | Date | Feb. 2, 2004 |

PTO/SB/17 (01-03)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE


# FEE TRANSMITTAL for FY 2003

*Effective 01/01/2003. Patent fees are subject to annual revision.*

☐ Applicant claims small entity status. See 37 CFR 1.27

**TOTAL AMOUNT OF PAYMENT** ($)

| *Complete If Known* | |
|---|---|
| Application Number | 08/914,536 |
| Filing Date | August 19, 1997 |
| First Named Inventor | STEVENSON, Michael J. |
| Examiner Name | Erma C. Cameron |
| Art Unit | 1762 |
| Attorney Docket No. | STEV-106 |

## METHOD OF PAYMENT *(check all that apply)*

☑ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☐ Deposit Account:

Deposit Account Number

Deposit Account Name

**The Commissioner is authorized to:** *(check all that apply)*

☐ Charge fee(s) indicated below ☐ Credit any overpayments

☐ Charge any additional fee(s) during the pendency of this application

☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

## FEE CALCULATION

### 1. BASIC FILING FEE

| Large Entity Fee Code | Large Entity Fee ($) | Small Entity Fee Code | Small Entity Fee ($) | Fee Description | Fee Paid |
|---|---|---|---|---|---|
| 1001 | 750 | 2001 | 375 | Utility filing fee | |
| 1002 | 330 | 2002 | 165 | Design filing fee | |
| 1003 | 520 | 2003 | 260 | Plant filing fee | |
| 1004 | 750 | 2004 | 375 | Reissue filing fee | |
| 1005 | 160 | 2005 | 80 | Provisional filing fee | |

SUBTOTAL (1) ($)

### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

| | Extra Claims | | Fee from below | Fee Paid |
|---|---|---|---|---|
| Total Claims | | -20** = | | X = |
| Independent Claims | | - 3** = | | X = |
| Multiple Dependent | | | | = |

| Large Entity Fee Code | Large Entity Fee ($) | Small Entity Fee Code | Small Entity Fee ($) | Fee Description |
|---|---|---|---|---|
| 1202 | 18 | 2202 | 9 | Claims in excess of 20 |
| 1201 | 84 | 2201 | 42 | Independent claims in excess of 3 |
| 1203 | 280 | 2203 | 140 | Multiple dependent claim, if not paid |
| 1204 | 84 | 2204 | 42 | ** Reissue independent claims over original patent |
| 1205 | 18 | 2205 | 9 | ** Reissue claims in excess of 20 and over original patent |

SUBTOTAL (2) ($)

**or number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

### 3. ADDITIONAL FEES

| Large Entity Fee Code | Large Entity Fee ($) | Small Entity Fee Code | Small Entity Fee ($) | Fee Description | Fee Paid |
|---|---|---|---|---|---|
| 1051 | 130 | 2051 | 65 | Surcharge - late filing fee or oath | |
| 1052 | 50 | 2052 | 25 | Surcharge - late provisional filing fee or cover sheet | |
| 1053 | 130 | 1053 | 130 | Non-English specification | |
| 1812 | 2,520 | 1812 | 2,520 | For filing a request for *ex parte* reexamination | |
| 1804 | 920* | 1804 | 920* | Requesting publication of SIR prior to Examiner action | |
| 1805 | 1,840* | 1805 | 1,840* | Requesting publication of SIR after Examiner action | |
| 1251 | 110 | 2251 | 55 | Extension for reply within first month | |
| 1252 | 410 | 2252 | 205 | Extension for reply within second month | |
| 1253 | 930 | 2253 | 465 | Extension for reply within third month | |
| 1254 | 1,450 | 2254 | 725 | Extension for reply within fourth month | |
| 1255 | 1,970 | 2255 | 985 | Extension for reply within fifth month | |
| 1401 | 320 | 2401 | 160 | Notice of Appeal | |
| 1402 | 320 | 2402 | 160 | Filing a brief in support of an appeal | 165.00 |
| 1403 | 280 | 2403 | 140 | Request for oral hearing | |
| 1451 | 1,510 | 1451 | 1,510 | Petition to institute a public use proceeding | |
| 1452 | 110 | 2452 | 55 | Petition to revive - unavoidable | |
| 1453 | 1,300 | 2453 | 650 | Petition to revive - unintentional | |
| 1501 | 1,300 | 2501 | 650 | Utility issue fee (or reissue) | |
| 1502 | 470 | 2502 | 235 | Design issue fee | |
| 1503 | 630 | 2503 | 315 | Plant issue fee | |
| 1460 | 130 | 1460 | 130 | Petitions to the Commissioner | |
| 1807 | 50 | 1807 | 50 | Processing fee under 37 CFR 1.17(q) | |
| 1806 | 180 | 1806 | 180 | Submission of Information Disclosure Stmt | |
| 8021 | 40 | 8021 | 40 | Recording each patent assignment per property (times number of properties) | |
| 1809 | 750 | 2809 | 375 | Filing a submission after final rejection (37 CFR 1.129(a)) | |
| 1810 | 750 | 2810 | 375 | For each additional invention to be examined (37 CFR 1.129(b)) | |
| 1801 | 750 | 2801 | 375 | Request for Continued Examination (RCE) | |
| 1802 | 900 | 1802 | 900 | Request for expedited examination of a design application | |

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid **SUBTOTAL (3)** ($) 165.00

| SUBMITTED BY | | | | (Complete *if applicable*) | |
|---|---|---|---|---|---|
| Name (Print/Type) | Robert E. Strauss | Registration No. (Attorney/Agent) | 19,364 | Telephone | 760 773-0715 |
| Signature | | | | Date | Feb. 2, 2004 |

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**BEFORE THE BOARD OF APPEALS AND PATENT INTERFERENCES**

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APPLICANT: Michael J. Stevenson et al

SERIAL NO.: 08/914,536

FILED: August 19, 1997

TITLE: METHOD AND COMPOSITION TO ENHANCE POLYOLEFIN SURFACES

UNIT: 1100

ATTORNEY: Erma Cameron

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# APPELLANTS' BRIEF ON APPEAL

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Copy of Claims

Table of Cited Cases

Copy of Declaration by R. Reeves filed on October 17, 2003.

## STATEMENT OF REAL PARTY IN INTEREST

The real party in interest is Michael J. Stevenson by virtue of an assignment of all rights from coinventor R. Alan Reeves. This assignment is not presently recorded in the U.S. Patent Office records.

## STATEMENT OF RELATED APPEALS AND INTERFERENCES

There are no other appeals and no interferences related to this application and appeal.

## STATEMENT OF STATUS OF CLAIMS

The claims pending in this application are claims 47 through 58. As pointed out in the next statement there is a pending amendment seeking cancellation of claims 56 and 57. Anticipating entry of this amendment, this Appeal Brief addresses the status of claims as claims 47 through 55 and 58,

## STATEMENT OF STATUS OF AMENDMENTS

An amendment after final has been filed concurrently with the filing of this Appeal Brief. Since this amendment reduces the issues on appeal, it is reasonably believed that it will be entered.

## SUMMARY OF INVENTION

The invention is a method for permanently and decoratively enhancing surfaces of preformed polyethylene articles; *(spec. page 1, lines 2-4).*

Articles formed of polyethylene, have low receptivity to coatings, paints, inks, and the like; (*spec. page 1, lines 22-24).*

The surfaces of preformed polyethylene articles, are permanently colored by the claimed method which comprises coating the surfaces of the articles with a

decorative enhancement composition which comprises a mixture of a colorant and particulate polyethylene and heating the coated surface to fuse the coating into the surface of the preformed polyethylene article; *(spec. page 2, lines 14-21).*

The method is facilitated by incorporating a binder solid in the decorative enhancement composition which temporarily binds the colorant and polyethylene powders to the surface of the polyethylene article until the coating can be heated and fused into the surface of the polyethylene article. The colorant, polyethylene powder and binder are dispersed in a liquid carrier and blended to a uniform consistency suitable for application by spraying, dipping, brushing, etc.; *(spec., page 2, lines 21-27).*

The binder solid is optional, as it only serves as a processing aid, as it: "promotes adhesion of the colorant and thermoplastic to the polyolefin surface until the decorative enhancement composition can be incorporated into the polyolefin surface of the preformed article." *(spec. p.4, lines 11-15)* It is useful when applying color to small or intricate patterns such as the eye and pupil of a figure, as shown in FIGS. 1 and 2.

Disclosure Relevant To The Heating Step:

The specification has the following disclosures regarding the method and conditions of heating to achieve fusion of the coating and surface of the polyethylene article. The method comprising "coating the surfaces of the articles with a decorative enhancement composition which comprises a mixture of a colorant and particulate polyethylene and heating the coated surface to fuse the coating into the surface of the preformed polyethylene article; *(spec. page 2, lines 14-21).*

The specification states that the surface of the polyethylene article is heated to 250° F. for sufficient time, depending on the heating method, to fuse the coating into the surface of the polyethylene article. This is disclosed in the specification as follows:

The coatings of the clear overcoat composition and decorative enhancement composition and the underlying polyolefin surface are heated to a temperature above about 250 degrees Fahrenheit and for sufficient time to incorporate the coatings into the polyolefin surface. The length of time of heating depends significantly on variables such as the type of heating, e.g., an open flame or a heat gun, the area of the coatings and wall thickness of the article. The time can be only a few seconds when using an open flame while up to one or two minutes when using a heat gun. Care must be taken not to overheat the surface of the article such that warpage of the article occurs. The heat source can be applied in several ways such as by passing an open flame over the coated area, passing a heating element over the coated area, and/or blowing hot air over the coated area are acceptable methods. *(spec., page 9, lines 13-28).*

Once heated, the coatings of the clear overcoat and decorative enhancement compositions become incorporated into the surface of the polyolefin, presumably by fusion at the interface of the coatings and the polyolefin surface.; *(spec. page 9, lines 29-32)*

## ISSUES

Issues presented in this appeal for consideration of Groups A and B are:

1. Does the prior art reference present a *prima facie* case of obviousness of the claimed method?

A. Does the prior art reference teach the use of polyethylene powder in the decorative enhancement composition to be used in the claimed method?

B. Does a teaching of the use of "polyolefin powder"

obviously suggest the use of polyethylene powder?

2. Can the use of a species broadly encompassed by a genus be unobvious upon a showing of special properties or functioning of the species which is not shared by other species within the genus?

3. Have applicants presented evidence that polyethylene powders used in the claimed method achieves results which are unexpected by the prior art in that polyethylene powders achieve permanent coloring of polyethylene surfaces while other species within the genus fail to provide this result?

A. Are the tests and results reported in the declaration by R. Reeves meaningful?

B. Does the showing by Applicants in the Reeves declaration overcome a *prima facie* case of obviousness based on the prior art reference?

Additional Issues with regard to Group B Claims:

Does the prior art reference teach or suggest that the coating of a decorative enhancement composition on a polyethylene object is to be fused into the surface of a polyethylene object and that fusion of the coating into the coated surface will achieve permanency of the coating?

Does the prior art reference teach or suggest that a decorative enhancement composition to coat the surface of a polyethylene object should contain polyethylene powder and teach or suggest the conditions of heating that coated surface which will achieve fusion of the decorative enhancement composition into the surface of a polyethylene object?

## GROUPING OF CLAIMS

The claims on appeal are grouped into the following for purposes of this appeal:

Group A: Claims 47-49 and 51-55

Group B: Claims 50 and 58

As pointed out in the following arguments, Claims of Group B are patentably distinct from those of Group A by their recitation that the heating step of the method is sufficient to fuse the decorative enhancement composition into the surface of the polyethylene object.

**APPELLANTS' ARGUMENTS**

A. ARGUMENTS RELEVANT TO BOTH GROUPS OF THE CLAIMS

The surfaces of molded polyethylene articles are extremely difficult to coat and numerous attempts have been made to achieve coatings on these surfaces which is permanent, i.e., resists solvent and abrasive attacks. The method recited by the claims on appeal achieves a permanent coating on polyethylene surfaces because it employs a coating mixture which contains polyethylene powder, which fuses into the surface of the polyethylene article when the coated surface is heated sufficiently,.

The prior art reference teaches the use of polyolefin powder in a thermoplastic spray material, which is used to coat the surfaces of plastic objects, including polyethylene objects.

The prior art reference does not contain a specific teaching or suggestion of the use of polyethylene powder in its "thermoplastic spray material".

The prior art reference provides no examples of specific "polyolefins" and one skilled in the art is faced with an extraordinarily large class of possible selections of polymers having widely differing properties. Literally, any polymer formed by polymerization of an olefinic monomer, such as polybutene, polyisobutylene, polyvinyl chloride, polyvinyl acetate, poly(ethylene-vinyl acetate), styrene-butadiene rubber copolymer, polystyrene, etc., is included in the definition.

It is appellants' contention that the prior art reference, by its failure to identify

even a single specific, operative polyolefin, fails to present even a *prima facie* case of obviousness.

However, appellants submit that even if the prior art reference is sufficient to raise a *prima facie* case of obviousness, the fact that, of all the polyolefins, only polyethylene powder when used in the coating mixture, permits the coating to be fused into the surface of the molded article. That polyethylene, of all the possible polyolefins, exhibits this property is unexpected and surprising and establishes the unobviousness and patentability of the claims of both Groups A and B.

The discovery "that some compounds falling within prior art genus, have a special significance and where there is nothing in the prior art to suggest criticality" is the basis for allowability of claims; *In re Lemin*, 141 USPQ 814-816, 815-6 (CCPA 1964) [discovery of herbicidal properties of allyloxy-benzoates having a limited range of total number of carbons in the ester and alkoxy substituents].

"One way for a patent applicant to rebut a prima facie case of obviousness is to make a showing of 'unexpected results,' i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected. The basic principle behind this rule is straightforward –that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious." *In re Soni* 34 USPQ2d 1684-1692, 1687 (Fed.Cir. 1995) [discovery that polyethylene of a high molecular weight improved the tensile and peel strength of an electrically conductive hot melt composition held patentable over prior art suggesting electrically conductive hot melt compositions containing polyethylene.]

The prior art reference also fails to teach or suggest heating conditions which will fuse its decorative enhancement composition into the surface of a polyethylene object. The only teaching is that the coated surface is to be heated to incorporate the coating into and onto the surface of the coated article, so that the coating will resist

chipping and fading. Permanency of the coating is not mentioned, fusion of the coating into the surface of the coated object is not mentioned, solvent resistance is not mentioned, and minimal conditions of heating, i.e., to a coated surface temperature of at least 250 degrees F. is not mentioned. Accordingly, those skilled in the art must select polyethylene from a large group of polyolefins and then must discover that the resultant coating could be fused into the surface of a coated polyethylene object by heating the coated surface sufficiently to fuse the coating into the surface, i.e., heating to a temperature of at least 250 degrees F.

The Showing Of Unexpected or Surprising Results:

Appellants filed a declaration by Alan Reeves, a coapplicant and coinventor, which describes comparative experiments performed with a number of polyolefin powders, including polyethylene powder, which demonstrate that the use of coating compositions containing polyethylene powder in the invention to coat the surface of a molded polyethylene article achieves a coating vastly superior to those obtained with other polyolefins in properties of peel resistance and solvent extraction. A copy of that declaration is included in the Appendix to this brief.

In the comparative experiments reported in the declaration, surfaces of rotationally molded, white polyethylene test cubes were coated with compositions containing a colorant (carbon black), solvent and a variety of polyolefin powders. Seven coating compositions were tested, each containing a different polyolefin. The seven different polyolefins which were tested as identified in the following table:

Polyolefins Tested:

Comp. No. 1: polyisobutylene

Comp. No. 2: polyvinyl chloride:

Comp. No. 3: styrene-butadiene rubber

Comp. No. 4: polybutene

Comp. No. 5: poly(ethylene-vinyl acetate)

Comp. No. 6: polystyrene

Comp. No. 7: polyethylene

Coating Procedure:

Each of the compositions was sprayed onto a surface of the white polyethylene test cubes and each of the coated surfaces was heated with a forced air, Bosch heat gun to a temperature in excess of 250 degrees F. for a period of one minute. The coatings were stored at room temperature for 24 hours and then the coated surfaces were cut from cubes and divided into two samples.

Testing for the Permanency Of The Coatings

Peel Resistance

One sample of each coated surfaces was scored with a razor blade in a grid pattern of criss-crossed parallel score lines and a pressure sensitive masking tape was applied and pressed tightly over each of the grid patterns. The masking tape was then pulled from the surface and the surface was inspected to determine if the tape lifted any of the coating from the polyethylene surface.

Solvent Extraction

One sample of each coated surface was subjected to a solvent extraction test by placing the samples in closed containers with 500 milliliters of lacquer solvent. The containers of sample and solvent were tumbled for one hour at room temperature. The containers were opened, the contents and color of the solvent was observed and each sample was inspected to determine the condition of its coating.

Test Results

Peel Resistance

The coatings of all the compositions, except for Compositions 5 and 7 failed the peel test. The coating of Composition 1 split, with the tape removing the outer half surface, the coating of Composition 2 completely peeled off with the tape; the coating of Composition 3 separated from the polyethylene surface along the score

lines; the coating of Composition 4 split, similar to that of Composition 1; and the coating of Composition 6 completely peeled off with the tape. The tapes on the coatings of Compositions 5, which contained poly(ethylene-vinyl acetate) and 7, which contained polyethylene, separated cleanly from the coatings without removing any significant amounts of the coatings.

Solvent Resistance

The coatings of all the compositions, except for the coating of composition 7 which contained the polyethylene powder, dissolved in the lacquer solvent, discoloring the solvent with a grey to black color from the carbon black colorant. The solvent from the testing of the sample coated with composition 7 was clear with no grey or black coloration and free of any flakes or particles of the coating.

The declaration by Mr. Reeves concludes with the following statement:

> For several years I have worked on formulation of various compositions suitable for use in the invention and I have attempted to use polyolefins other than polyethylene for application to the surfaces of molded polyethylene articles. Only compositions containing polyethylene powders have been found to be universally adaptable to yield coatings which fuse into the surface of a molded polyethylene article and which consistently pass the inspections of peel and solvent resistance described in this declaration.

It is submitted that the foregoing constitutes convincing evidence of an unexpected, i.e., surprising, functioning and results when polyethylene powder is used in the coating compositions employed in the claimed method. None of the compositions containing polyolefins, other than polyethylene, exhibited solvent

resistance. As stated by Mr. Reeves, only the composition containing polyethylene powders fused into the surface of the molded polyethylene article.

The examiner challenged the efficacy of the results in an advisory action, stating:

> ...the compositions being compared do not have equivalent amounts of the various polyolefins. Therefore the comparison cannot fairly be made between the various polyolefins.

The examiner's statement ignores the following comment by Mr. Reeves in his declaration:

> Variations in the coating compositions were only made to obtain compositions suitable for spray application.

The application teaches that the compositions are to be formulated as required to obtain the necessary (desirable) properties for the application method; see the following statements:

> The amount of liquid carrier in the enhancement composition will be determined to some extent by the application method. *(Spec. page 6, lines 29-31)*
>
> Thereafter, the proportion of liquid carrier in the decorative enhancement composition can be adjusted to obtain the desirable flow properties (viscosity) for application to the preselected area of the polyolefin surface to provide a uniform coating. *(Spec. page 7, lines 10-14).*

The examiner's opinion also ignores the dramatic nature of the comparative results. The data do not merely show a slightly better performance by composition 7 which contained polyethylene powder. Instead the data show that all the compositions, save for that containing polyethylene, failed to provide permanency of the coatings. This is evidenced by the solvent extraction testing which dissolved

all coatings of compositions containing polyolefins other than that containing polyethylene. Also, all coatings except that containing polyethylene and that containing a copolymer of ethylene and vinyl acetate did not resist peeling. When, as here, the "other" polyolefins entirely failed to exhibit any coating permanency, it is not reasonable to expect that somewhat more or somewhat less of the polyolefin in the compositions would improve the results.

B. ARGUMENTS RELEVANT TO GROUP B CLAIMS

The prior art reference fails to teach or suggest that the coated polyolefin surface should be heat treated sufficiently to fuse the coating into the surface of the coated polyolefin object. Specifically the reference teaches that coatings of its thermoplastic spray material are heated "so that the thermoplastic spray material will blend into and onto the surface of the plastic object" *(page 20, lines 15-17)* and *(page 21, lines 6-8)*. If not so blended, "the thermoplastic spray material on the plastic object will chip and fade over time" (page 20, lines 19-20). The conditions of heating, i.e., temperature, selection of heating means and how such selection affects the duration of heating are not described. The reference also fails to describe a permanency of the coating, stating only that it should not chip or fade, results which are not as meaningful to evaluate permanency as resistance to solvent extraction and peel resistance.

Summary Of Argument

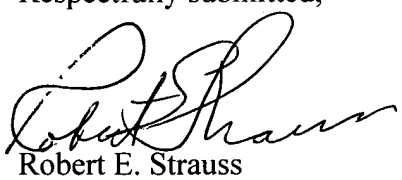
It is submitted that the claims of Groups A and B on appeal are patentable as these claims recite a method which yields results which are unexpected, hence, surprising, over the prior art. Specifically, the claimed method employs coating compositions which contain polyethylene and subjecting the coated surfaces to heating sufficient to render the coating permanent in that it resists solvent extraction and peeling, heating which is disclosed as sufficient to heat the surface to above about 250 degrees F Neither the selection of polyethylene powders, nor the

necessary heating conditions to fuse the coating into the surface of a polyethylene object are suggested by the prior art.

As to the claims of Group B, the heating is defined as sufficient to fuse the coating into the surface of the polyethylene article, an objective not suggested by the prior art reference.

For the foregoing reasons, reversal of the Examiner's final rejection of the claims on appeal is respectfully solicited.

Respectfully submitted,



Robert E. Strauss

Reg. No. 19,364

## APPENDIX

A correct copy of the claims on appeal is as follows:

47. A method for decorative enhancement of a polyethylene surface of a molded polyethylene article, which method comprises the steps of:

(a) combining a decorative enhancement composition and said polyethylene surface wherein said decorative enhancement composition consists essentially of:
(1) an inert organic solvent that provides the decorative enhancement composition with a consistency and viscosity for liquid methods of application;
(2) a colorant to impart a surface color;
(3) a binder solid selected from the class consisting of aromatic and aliphatic hydrocarbon resins, waxes, rosins, and terpene-based resins; and
(4) polyethylene powder; and

(b) heating said decorative enhancement composition and said polyethylene surface to incorporate said decorative enhancement composition into said polyethylene surface and produce a molded polyethylene article having said surface decoratively enhanced by said colorant.

48. The method of Claim 47 wherein said molded polyethylene article is a preformed, rotationally molded polyethylene article.

49. The method of Claim 48 wherein said combining step is accomplished by applying said decorative enhancement composition to said preformed rotationally molded polyethylene

**APPENDIX**

article.

50. The method of Claim 49 wherein said heating step is accomplished by heating said decorative enhancement composition and said surface of the preformed rotationally molded polyethylene article to fuse said decorative enhancement composition into said surface.

51. The method of Claim 47 wherein said liquid carrier comprises 20 to 90 weight percent of said decorative enhancement composition.

52. The method of Claim 47 wherein said colorant, said binder solid and said polyethylene powder collectively comprise 10 to 80 weight percent of said decorative enhancement composition.

53. The method of claim 52 wherein said colorant comprises 9 to 50 weight percent of colorant, binder solid and polyethylene, and said binder and said polyethylene powder collectively comprises 50 to 91 weight percent of colorant, binder solid and polyethylene.

55. The method of Claim 53 wherein said polyethylene powder has a density from 0.88 to 0.97 grams/cubic centimeter and a particle size no greater than 140 microns.

58. A method for decorative enhancement of a polyethylene surface of a molded polyethylene article, which method comprises the steps of:

(a) combining a decorative enhancement composition and said polyethylene surface wherein said decorative enhancement composition consists essentially of:

(1) an inert organic solvent that provides the decorative enhancement composition with a consistency and viscosity for liquid methods of application;

## APPENDIX

(2) a colorant to impart a surface color;

(3) a binder solid selected from the class consisting of aromatic and aliphatic hydrocarbon resins, waxes, rosins, and terpene-based resins; and

(4) polyethylene powder; and

(b) heating said decorative enhancement composition and said polyethylene surface to fuse said decorative enhancement composition into said polyethylene surface and produce a molded polyethylene article having said surface decoratively enhanced by said colorant.

TABLE OF CITED CASES:

Ex parte Lemin 141 USPQ 814-816, 815-6 (CCPA 1964) ..... page 6

In re Soni, *In re Soni* 34 USPQ2d 1684-1692, 1687 (Fed.Cir. 1995) .....page 6

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICANT: Michael J. Stevenson
SER. NO. 08/914,536
FILED: August 19, 1997
TITLE: METHOD AND COMPOSITION TO ENHANCE POLYOLEFIN SURFACES
UNIT: 1762
EXAMINER: Erma C. Cameron

**DECLARATION BY ALAN REEVES**

I, R. Alan Reeves, declare and say as follows:

The following statements are made of my own knowledge and belief, and if called to testify, I could competently testify to the following:

I am a coapplicant of the above identified application and a coinventor of the subject matter described and claimed therein. The subject invention comprises a method to apply a permanent coating to the surface of molded polyethylene articles by applying a composition of polyethylene powder and colorant in an inert hydrocarbon solvent to the surface of a molded polyethylene article and then heating the coating and the coated surface to an elevated temperature to cause the coating to become fused into the surface of the polyethylene article. The particular combination of the use of polyethylene powder in the composition for the coating of polyethylene articles achieves results in the subject invention which are far superior to the use of other polyolefin powders in that the coatings

I have recently performed comparative experiments that demonstrate that the use of polyethylene powder in the coating composition is far superior to the use of other polyolefin powders. Specifically, I coated the surfaces of rotationally molded polyethylene test cubes with coating compositions which were constituted with polyethylene powder and powders of other, different polyolefins. The test cubes were 8 inches x 8 inches x 8 inches and were obtained by the rotational molding of a conventional, granulated, white polyethylene molding resin having a size range of 35 mesh. The following coating compositions which were used:

| Comp. No. 1 | | Comp. No. 2 | |
|---|---|---|---|
| Polyisobutylene: | 50 | Polyvinyl Chloride: | 200 |
| Carbon Black: | 5 | Carbon Black: | 10 |
| Toluene | 200 | Toluene: | 100 |

| Comp. No. 3 | | Comp. No. 4 | |
|---|---|---|---|
| SBR* | 50 | Polybutene: | 50 |
| Carbon Black: | 5 | Carbon Black: | 5 |
| Toluene: | 250 | Toluene: | 200 |

*styrene-butadiene rubber

| Comp. No. 5 | | Comp. No. 6 | |
|---|---|---|---|
| EVA* | 90 | Polystyrene: | 50 |
| Carbon Black: | 10 | Carbon Black: | 5 |
| Toluene: | 300 | Toluene: | 200 |

*poly(ethylene-vinyl acetate)

The control composition, for comparative testing was:

| Comp. No. 7 | |
|---|---|
| Polyethylene: | 90 |
| Carbon Black: | 10 |
| Toluene: | 200 |

Variations in the coating compositions were only made to obtain compositions suitable for spray application. Because the poly(ethylene-vinyl acetate) and the polyethylene were solid powders, I added a minor amount of a hydrocarbon resin to compositions 5 and 7 to obtain sprayed coatings with these compositions which covered the polyethylene surfaces. The hydrocarbon resin I used was a resin which was known to have no effect on the adhesiveness of coatings after the heat treatment.

Each of the aforementioned compositions was sprayed onto a surface of a white, polyethylene test cube and each of the coated surfaces was heated with a forced air, Bosch heat gun to a temperature in excess of 250 degrees F. for a period of one minute. The coatings were stored at room temperature for 24 hours and then the coated surfaces were cut from cubes and divided into two samples which were subjected to the tests described in the following paragraphs.

One sample of each of the coated surfaces was scored with a razor blade in a grid pattern of criss-crossed parallel score lines and a pressure sensitive masking tape was applied and pressed tightly over each of the grid patterns. The masking tape was then pulled from the surface and the surface was inspected to determine if the tape lifted the coating from the polyethylene surface. The inspection revealed that coatings of all the compositions, except for Compositions 5 and 7 failed the test. The coating of Composition 1 split, with the tape removing the outer half surface, the coating of Composition 2 completely peeled off with the tape; the coating of Composition 3 separated from the polyethylene surface along the score lines; the coating of Composition 4 split, similar to that of Composition 1; and the coating of Composition 6 completely peeled off with the tape. The tapes on the coatings of Compositions 5 and 7 separated cleanly from the coatings without removing any significant amounts of the coatings.

The second samples of each of the coated surfaces were then tested for solvent resistance. In this test, each sample was placed in a closed container with 500 milliliters of lacquer solvent and the containers were tumbled for one hour at room temperature. The containers were opened, the color of the solvent was observed and each sample was inspected to determine the condition of its coating.

All of the samples failed this test, except for the coating of composition 7 which contained the polyethylene powder. The solvent from the testing of the sample coated with composition 7 was clear with no grey or black coloration and free of any flakes or particles of the coating.

The solvents from all the other samples were black in color and contained flakes of the coatings. The inspection of the coatings revealed that the coatings of Composition Nos. 2 (polyvinyl chloride) and 6 (polystyrene) were completely removed and the polyethylene surfaces of these samples were as white as the uncoated surfaces of the molded polyethylene test cubes. The coatings of Compositions 1 (polyisobutylene) and 4 (polybutene) were light to medium grey coloration, indicating that most of the coatings had dissolved in the solvent. The coating of Composition 3 (styrene-butadiene rubber) was a dark grey color, however, the coating completely separated from the polyethylene surface when rubbed with a cloth. The coating of Composition 5 (poly ethylene-vinyl acetate) was etched by the solvent.

The peel and solvent resistances of the coating from Composition 7 evidence that the coating was incorporated by fusion into the surface of the molded polyethylene surface, whereas all the coatings from the other compositions did not fuse into the polyethylene surface.

For several years I have worked on formulation of various compositions

suitable for use in the invention and I have attempted to use polyolefins other than polyethylene for application to the surfaces of molded polyethylene articles. Only compositions containing polyethylene powders have been found to be universally adaptable to yield coatings which fuse into the surface of a molded polyethylene article and which consistently pass the inspections of peel and solvent resistance described in this declaration.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable be fine or imprisonment, or both, under Section 1001 of Title of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent resulting therefrom.

Declared at Clarkdale, Arizona this 9th day of September, 2003.

R. Alan Reeves

R. Alan Reeves

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**BEFORE THE BOARD OF APPEALS AND PATENT INTERFERENCES**

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APPLICANT: Michael J. Stevenson et al

SERIAL NO.: 08/914,536

FILED: August 19, 1997

TITLE: METHOD AND COMPOSITION TO ENHANCE POLYOLEFIN SURFACES

UNIT: 1100

ATTORNEY: Erma Cameron

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# APPELLANTS' BRIEF ON APPEAL

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Copy of Claims

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Copy of Declaration by R. Reeves filed on October 17, 2003.

## STATEMENT OF REAL PARTY IN INTEREST

The real party in interest is Michael J. Stevenson by virtue of an assignment of all rights from coinventor R. Alan Reeves. This assignment is not presently recorded in the U.S. Patent Office records.

## STATEMENT OF RELATED APPEALS AND INTERFERENCES

There are no other appeals and no interferences related to this application and appeal.

## STATEMENT OF STATUS OF CLAIMS

The claims pending in this application are claims 47 through 58. As pointed out in the next statement there is a pending amendment seeking cancellation of claims 56 and 57. Anticipating entry of this amendment, this Appeal Brief addresses the status of claims as claims 47 through 55 and 58,

## STATEMENT OF STATUS OF AMENDMENTS

An amendment after final has been filed concurrently with the filing of this Appeal Brief. Since this amendment reduces the issues on appeal, it is reasonably believed that it will be entered.

## SUMMARY OF INVENTION

The invention is a method for permanently and decoratively enhancing surfaces of preformed polyethylene articles; *(spec. page 1, lines 2-4).*

Articles formed of polyethylene, have low receptivity to coatings, paints, inks, and the like; (*spec. page 1, lines 22-24).*

The surfaces of preformed polyethylene articles, are permanently colored by the claimed method which comprises coating the surfaces of the articles with a

decorative enhancement composition which comprises a mixture of a colorant and particulate polyethylene and heating the coated surface to fuse the coating into the surface of the preformed polyethylene article; *(spec. page 2, lines 14-21).*

The method is facilitated by incorporating a binder solid in the decorative enhancement composition which temporarily binds the colorant and polyethylene powders to the surface of the polyethylene article until the coating can be heated and fused into the surface of the polyethylene article. The colorant, polyethylene powder and binder are dispersed in a liquid carrier and blended to a uniform consistency suitable for application by spraying, dipping, brushing, etc.; *(spec., page 2, lines 21-27).*

The binder solid is optional, as it only serves as a processing aid, as it: "promotes adhesion of the colorant and thermoplastic to the polyolefin surface until the decorative enhancement composition can be incorporated into the polyolefin surface of the preformed article." *(spec. p.4, lines 11-15)* It is useful when applying color to small or intricate patterns such as the eye and pupil of a figure, as shown in FIGS. 1 and 2.

Disclosure Relevant To The Heating Step:

The specification has the following disclosures regarding the method and conditions of heating to achieve fusion of the coating and surface of the polyethylene article. The method comprising "coating the surfaces of the articles with a decorative enhancement composition which comprises a mixture of a colorant and particulate polyethylene and heating the coated surface to fuse the coating into the surface of the preformed polyethylene article; *(spec. page 2, lines 14-21).*

The specification states that the surface of the polyethylene article is heated to 250° F. for sufficient time, depending on the heating method, to fuse the coating into the surface of the polyethylene article. This is disclosed in the specification as follows:

The coatings of the clear overcoat composition and decorative enhancement composition and the underlying polyolefin surface are heated to a temperature above about 250 degrees Fahrenheit and for sufficient time to incorporate the coatings into the polyolefin surface. The length of time of heating depends significantly on variables such as the type of heating, e.g., an open flame or a heat gun, the area of the coatings and wall thickness of the article. The time can be only a few seconds when using an open flame while up to one or two minutes when using a heat gun. Care must be taken not to overheat the surface of the article such that warpage of the article occurs. The heat source can be applied in several ways such as by passing an open flame over the coated area, passing a heating element over the coated area, and/or blowing hot air over the coated area are acceptable methods. *(spec., page 9, lines 13-28).*

Once heated, the coatings of the clear overcoat and decorative enhancement compositions become incorporated into the surface of the polyolefin, presumably by fusion at the interface of the coatings and the polyolefin surface.; *(spec. page 9, lines 29-32)*

**ISSUES**

Issues presented in this appeal for consideration of Groups A and B are:

1. Does the prior art reference present a *prima facie* case of obviousness of the claimed method?

A. Does the prior art reference teach the use of polyethylene powder in the decorative enhancement composition to be used in the claimed method?

B. Does a teaching of the use of "polyolefin powder"

obviously suggest the use of polyethylene powder?

2. Can the use of a species broadly encompassed by a genus be unobvious upon a showing of special properties or functioning of the species which is not shared by other species within the genus?

3. Have applicants presented evidence that polyethylene powders used in the claimed method achieves results which are unexpected by the prior art in that polyethylene powders achieve permanent coloring of polyethylene surfaces while other species within the genus fail to provide this result?

A. Are the tests and results reported in the declaration by R. Reeves meaningful?

B. Does the showing by Applicants in the Reeves declaration overcome a *prima facie* case of obviousness based on the prior art reference?

Additional Issues with regard to Group B Claims:

Does the prior art reference teach or suggest that the coating of a decorative enhancement composition on a polyethylene object is to be fused into the surface of a polyethylene object and that fusion of the coating into the coated surface will achieve permanency of the coating?

Does the prior art reference teach or suggest that a decorative enhancement composition to coat the surface of a polyethylene object should contain polyethylene powder and teach or suggest the conditions of heating that coated surface which will achieve fusion of the decorative enhancement composition into the surface of a polyethylene object?

## GROUPING OF CLAIMS

The claims on appeal are grouped into the following for purposes of this appeal:

Group A: Claims 47-49 and 51-55

Group B: Claims 50 and 58.

As pointed out in the following arguments, Claims of Group B are patentably distinct from those of Group A by their recitation that the heating step of the method is sufficient to fuse the decorative enhancement composition into the surface of the polyethylene object.

## APPELLANTS' ARGUMENTS

### A. ARGUMENTS RELEVANT TO BOTH GROUPS OF THE CLAIMS

The surfaces of molded polyethylene articles are extremely difficult to coat and numerous attempts have been made to achieve coatings on these surfaces which is permanent, i.e., resists solvent and abrasive attacks. The method recited by the claims on appeal achieves a permanent coating on polyethylene surfaces because it employs a coating mixture which contains polyethylene powder, which fuses into the surface of the polyethylene article when the coated surface is heated sufficiently,.

The prior art reference teaches the use of polyolefin powder in a thermoplastic spray material, which is used to coat the surfaces of plastic objects, including polyethylene objects.

The prior art reference does not contain a specific teaching or suggestion of the use of polyethylene powder in its "thermoplastic spray material".

The prior art reference provides no examples of specific "polyolefins" and one skilled in the art is faced with an extraordinarily large class of possible selections of polymers having widely differing properties. Literally, any polymer formed by polymerization of an olefinic monomer, such as polybutene, polyisobutylene, polyvinyl chloride, polyvinyl acetate, poly(ethylene-vinyl acetate), styrene-butadiene rubber copolymer, polystyrene, etc., is included in the definition.

It is appellants' contention that the prior art reference, by its failure to identify

even a single specific, operative polyolefin, fails to present even a *prima facie* case of obviousness.

However, appellants submit that even if the prior art reference is sufficient to raise a *prima facie* case of obviousness, the fact that, of all the polyolefins, only polyethylene powder when used in the coating mixture, permits the coating to be fused into the surface of the molded article. That polyethylene, of all the possible polyolefins, exhibits this property is unexpected and surprising and establishes the unobviousness and patentability of the claims of both Groups A and B.

The discovery "that some compounds falling within prior art genus, have a special significance and where there is nothing in the prior art to suggest criticality" is the basis for allowability of claims; *In re Lemin*, 141 USPQ 814-816, 815-6 (CCPA 1964) [discovery of herbicidal properties of allyloxy-benzoates having a limited range of total number of carbons in the ester and alkoxy substituents].

"One way for a patent applicant to rebut a prima facie case of obviousness is to make a showing of 'unexpected results,' i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected. The basic principle behind this rule is straightforward –that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious." *In re Soni* 34 USPQ2d 1684-1692, 1687 (Fed.Cir. 1995) [discovery that polyethylene of a high molecular weight improved the tensile and peel strength of an electrically conductive hot melt composition held patentable over prior art suggesting electrically conductive hot melt compositions containing polyethylene.]

The prior art reference also fails to teach or suggest heating conditions which will fuse its decorative enhancement composition into the surface of a polyethylene object. The only teaching is that the coated surface is to be heated to incorporate the coating into and onto the surface of the coated article, so that the coating will resist

chipping and fading. Permanency of the coating is not mentioned, fusion of the coating into the surface of the coated object is not mentioned, solvent resistance is not mentioned, and minimal conditions of heating, i.e., to a coated surface temperature of at least 250 degrees F. is not mentioned. Accordingly, those skilled in the art must select polyethylene from a large group of polyolefins and then must discover that the resultant coating could be fused into the surface of a coated polyethylene object by heating the coated surface sufficiently to fuse the coating into the surface, i.e., heating to a temperature of at least 250 degrees F.

The Showing Of Unexpected or Surprising Results:

Appellants filed a declaration by Alan Reeves, a coapplicant and coinventor, which describes comparative experiments performed with a number of polyolefin powders, including polyethylene powder, which demonstrate that the use of coating compositions containing polyethylene powder in the invention to coat the surface of a molded polyethylene article achieves a coating vastly superior to those obtained with other polyolefins in properties of peel resistance and solvent extraction. A copy of that declaration is included in the Appendix to this brief.

In the comparative experiments reported in the declaration, surfaces of rotationally molded, white polyethylene test cubes were coated with compositions containing a colorant (carbon black), solvent and a variety of polyolefin powders. Seven coating compositions were tested, each containing a different polyolefin. The seven different polyolefins which were tested as identified in the following table:

Polyolefins Tested:

Comp. No. 1: polyisobutylene

Comp. No. 2: polyvinyl chloride:

Comp. No. 3: styrene-butadiene rubber

Comp. No. 4: polybutene

Comp. No. 5: poly(ethylene-vinyl acetate)

Comp. No. 6: polystyrene

Comp. No. 7: polyethylene

Coating Procedure:

Each of the compositions was sprayed onto a surface of the white polyethylene test cubes and each of the coated surfaces was heated with a forced air, Bosch heat gun to a temperature in excess of 250 degrees F. for a period of one minute. The coatings were stored at room temperature for 24 hours and then the coated surfaces were cut from cubes and divided into two samples.

Testing for the Permanency Of The Coatings

Peel Resistance

One sample of each coated surfaces was scored with a razor blade in a grid pattern of criss-crossed parallel score lines and a pressure sensitive masking tape was applied and pressed tightly over each of the grid patterns. The masking tape was then pulled from the surface and the surface was inspected to determine if the tape lifted any of the coating from the polyethylene surface.

Solvent Extraction

One sample of each coated surface was subjected to a solvent extraction test by placing the samples in closed containers with 500 milliliters of lacquer solvent. The containers of sample and solvent were tumbled for one hour at room temperature. The containers were opened, the contents and color of the solvent was observed and each sample was inspected to determine the condition of its coating.

Test Results

Peel Resistance

The coatings of all the compositions, except for Compositions 5 and 7 failed the peel test. The coating of Composition 1 split, with the tape removing the outer half surface, the coating of Composition 2 completely peeled off with the tape; the coating of Composition 3 separated from the polyethylene surface along the score

lines; the coating of Composition 4 split, similar to that of Composition 1; and the coating of Composition 6 completely peeled off with the tape. The tapes on the coatings of Compositions 5, which contained poly(ethylene-vinyl acetate) and 7, which contained polyethylene, separated cleanly from the coatings without removing any significant amounts of the coatings.

Solvent Resistance

The coatings of all the compositions, except for the coating of composition 7 which contained the polyethylene powder, dissolved in the lacquer solvent, discoloring the solvent with a grey to black color from the carbon black colorant. The solvent from the testing of the sample coated with composition 7 was clear with no grey or black coloration and free of any flakes or particles of the coating.

The declaration by Mr. Reeves concludes with the following statement:

> For several years I have worked on formulation of various compositions suitable for use in the invention and I have attempted to use polyolefins other than polyethylene for application to the surfaces of molded polyethylene articles. Only compositions containing polyethylene powders have been found to be universally adaptable to yield coatings which fuse into the surface of a molded polyethylene article and which consistently pass the inspections of peel and solvent resistance described in this declaration.

It is submitted that the foregoing constitutes convincing evidence of an unexpected, i.e., surprising, functioning and results when polyethylene powder is used in the coating compositions employed in the claimed method. None of the compositions containing polyolefins, other than polyethylene, exhibited solvent

resistance. As stated by Mr. Reeves, only the composition containing polyethylene powders fused into the surface of the molded polyethylene article.

The examiner challenged the efficacy of the results in an advisory action, stating:

> ...the compositions being compared do not have equivalent amounts of the various polyolefins. Therefore the comparison cannot fairly be made between the various polyolefins.

The examiner's statement ignores the following comment by Mr. Reeves in his declaration:

> Variations in the coating compositions were only made to obtain compositions suitable for spray application.

The application teaches that the compositions are to be formulated as required to obtain the necessary (desirable) properties for the application method; see the following statements:

> The amount of liquid carrier in the enhancement composition will be determined to some extent by the application method. *(Spec. page 6, lines 29-31)*
>
> Thereafter, the proportion of liquid carrier in the decorative enhancement composition can be adjusted to obtain the desirable flow properties (viscosity) for application to the preselected area of the polyolefin surface to provide a uniform coating. *(Spec. page 7, lines 10-14).*

The examiner's opinion also ignores the dramatic nature of the comparative results. The data do not merely show a slightly better performance by composition 7 which contained polyethylene powder. Instead the data show that all the compositions, save for that containing polyethylene, failed to provide permanency of the coatings. This is evidenced by the solvent extraction testing which dissolved

all coatings of compositions containing polyolefins other than that containing polyethylene. Also, all coatings except that containing polyethylene and that containing a copolymer of ethylene and vinyl acetate did not resist peeling. When, as here, the "other" polyolefins entirely failed to exhibit any coating permanency, it is not reasonable to expect that somewhat more or somewhat less of the polyolefin in the compositions would improve the results.

B. ARGUMENTS RELEVANT TO GROUP B CLAIMS

The prior art reference fails to teach or suggest that the coated polyolefin surface should be heat treated sufficiently to fuse the coating into the surface of the coated polyolefin object. Specifically the reference teaches that coatings of its thermoplastic spray material are heated "so that the thermoplastic spray material will blend into and onto the surface of the plastic object" *(page 20, lines 15-17)* and *(page 21, lines 6-8)*. If not so blended, "the thermoplastic spray material on the plastic object will chip and fade over time" (page 20, lines 19-20). The conditions of heating, i.e., temperature, selection of heating means and how such selection affects the duration of heating are not described. The reference also fails to describe a permanency of the coating, stating only that it should not chip or fade, results which are not as meaningful to evaluate permanency as resistance to solvent extraction and peel resistance.

Summary Of Argument

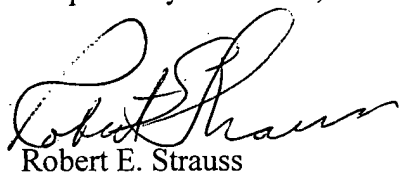
It is submitted that the claims of Groups A and B on appeal are patentable as these claims recite a method which yields results which are unexpected, hence, surprising, over the prior art. Specifically, the claimed method employs coating compositions which contain polyethylene and subjecting the coated surfaces to heating sufficient to render the coating permanent in that it resists solvent extraction and peeling, heating which is disclosed as sufficient to heat the surface to above about 250 degrees F Neither the selection of polyethylene powders, nor the

necessary heating conditions to fuse the coating into the surface of a polyethylene object are suggested by the prior art.

As to the claims of Group B, the heating is defined as sufficient to fuse the coating into the surface of the polyethylene article, an objective not suggested by the prior art reference.

For the foregoing reasons, reversal of the Examiner's final rejection of the claims on appeal is respectfully solicited.

Respectfully submitted,



Robert E. Strauss

Reg. No. 19,364

## APPENDIX

A correct copy of the claims on appeal is as follows:

47. A method for decorative enhancement of a polyethylene surface of a molded polyethylene article, which method comprises the steps of:

(a) combining a decorative enhancement composition and said polyethylene surface wherein said decorative enhancement composition consists essentially of:

(1) an inert organic solvent that provides the decorative enhancement composition with a consistency and viscosity for liquid methods of application;

(2) a colorant to impart a surface color;

(3) a binder solid selected from the class consisting of aromatic and aliphatic hydrocarbon resins, waxes, rosins, and terpene-based resins; and

(4) polyethylene powder; and

(b) heating said decorative enhancement composition and said polyethylene surface to incorporate said decorative enhancement composition into said polyethylene surface and produce a molded polyethylene article having said surface decoratively enhanced by said colorant.

48. The method of Claim 47 wherein said molded polyethylene article is a preformed, rotationally molded polyethylene article.

49. The method of Claim 48 wherein said combining step is accomplished by applying said decorative enhancement composition to said preformed rotationally molded polyethylene

## APPENDIX

article.

50. The method of Claim 49 wherein said heating step is accomplished by heating said decorative enhancement composition and said surface of the preformed rotationally molded polyethylene article to fuse said decorative enhancement composition into said surface.

51. The method of Claim 47 wherein said liquid carrier comprises 20 to 90 weight percent of said decorative enhancement composition.

52. The method of Claim 47 wherein said colorant, said binder solid and said polyethylene powder collectively comprise 10 to 80 weight percent of said decorative enhancement composition.

53. The method of claim 52 wherein said colorant comprises 9 to 50 weight percent of colorant, binder solid and polyethylene, and said binder and said polyethylene powder collectively comprises 50 to 91 weight percent of colorant, binder solid and polyethylene.

55. The method of Claim 53 wherein said polyethylene powder has a density from 0.88 to 0.97 grams/cubic centimeter and a particle size no greater than 140 microns.

58. A method for decorative enhancement of a polyethylene surface of a molded polyethylene article, which method comprises the steps of:

(a) combining a decorative enhancement composition and said polyethylene surface wherein said decorative enhancement composition consists essentially of:
(1) an inert organic solvent that provides the decorative enhancement composition with a consistency and viscosity for liquid methods of application;

## APPENDIX

(2) a colorant to impart a surface color;

(3) a binder solid selected from the class consisting of aromatic and aliphatic hydrocarbon resins, waxes, rosins, and terpene-based resins; and

(4) polyethylene powder; and

(b) heating said decorative enhancement composition and said polyethylene surface to fuse said decorative enhancement composition into said polyethylene surface and produce a molded polyethylene article having said surface decoratively enhanced by said colorant.

TABLE OF CITED CASES:

Ex parte Lemin 141 USPQ 814-816, 815-6 (CCPA 1964) ..... page 6

In re Soni, *In re Soni* 34 USPQ2d 1684-1692, 1687 (Fed.Cir. 1995) .....page 6

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Michael J. Stevenson
SER. NO. 08/914,536
FILED: August 19, 1997
TITLE: METHOD AND COMPOSITION TO ENHANCE POLYOLEFIN SURFACES
UNIT: 1762
EXAMINER: Erma C. Cameron



## DECLARATION BY ALAN REEVES

I, R. Alan Reeves, declare and say as follows:

The following statements are made of my own knowledge and belief, and if called to testify, I could competently testify to the following:

I am a coapplicant of the above identified application and a coinventor of the subject matter described and claimed therein. The subject invention comprises a method to apply a permanent coating to the surface of molded polyethylene articles by applying a composition of polyethylene powder and colorant in an inert hydrocarbon solvent to the surface of a molded polyethylene article and then heating the coating and the coated surface to an elevated temperature to cause the coating to become fused into the surface of the polyethylene article. The particular combination of the use of polyethylene powder in the composition for the coating of polyethylene articles achieves results in the subject invention which are far superior to the use of other polyolefin powders in that the coatings

I have recently performed comparative experiments that demonstrate that the use of polyethylene powder in the coating composition is far superior to the use of other polyolefin powders. Specifically, I coated the surfaces of rotationally molded polyethylene test cubes with coating compositions which were constituted with polyethylene powder and powders of other, different polyolefins. The test cubes were 8 inches x 8 inches x 8 inches and were obtained by the rotational molding of a conventional, granulated, white polyethylene molding resin having a size range of 35 mesh. The following coating compositions which were used:

| Comp. No. 1 | | Comp. No. 2 | |
|---|---|---|---|
| Polyisobutylene: | 50 | Polyvinyl Chloride: | 200 |
| Carbon Black: | 5 | Carbon Black: | 10 |
| Toluene | 200 | Toluene: | 100 |
| **Comp. No. 3** | | **Comp. No. 4** | |
| SBR* | 50 | Polybutene: | 50 |
| Carbon Black: | 5 | Carbon Black: | 5 |
| Toluene: | 250 | Toluene: | 200 |

*styrene-butadiene rubber

| Comp. No. 5 | | Comp. No. 6 | |
|---|---|---|---|
| EVA* | 90 | Polystyrene: | 50 |
| Carbon Black: | 10 | Carbon Black: | 5 |
| Toluene: | 300 | Toluene: | 200 |

*poly(ethylene-vinyl acetate)

The control composition, for comparative testing was:

| Comp. No. 7 | |
|---|---|
| Polyethylene: | 90 |
| Carbon Black: | 10 |
| Toluene: | 200 |

Variations in the coating compositions were only made to obtain compositions suitable for spray application. Because the poly(ethylene-vinyl acetate) and the polyethylene were solid powders, I added a minor amount of a hydrocarbon resin to compositions 5 and 7 to obtain sprayed coatings with these compositions which covered the polyethylene surfaces. The hydrocarbon resin I used was a resin which was known to have no effect on the adhesiveness of coatings after the heat treatment.

Each of the aforementioned compositions was sprayed onto a surface of a white, polyethylene test cube and each of the coated surfaces was heated with a forced air, Bosch heat gun to a temperature in excess of 250 degrees F. for a period of one minute. The coatings were stored at room temperature for 24 hours and then the coated surfaces were cut from cubes and divided into two samples which were subjected to the tests described in the following paragraphs.

One sample of each of the coated surfaces was scored with a razor blade in a grid pattern of criss-crossed parallel score lines and a pressure sensitive masking tape was applied and pressed tightly over each of the grid patterns. The masking tape was then pulled from the surface and the surface was inspected to determine if the tape lifted the coating from the polyethylene surface. The inspection revealed that coatings of all the compositions, except for Compositions 5 and 7 failed the test. The coating of Composition 1 split, with the tape removing the outer half surface, the coating of Composition 2 completely peeled off with the tape; the coating of Composition 3 separated from the polyethylene surface along the score lines; the coating of Composition 4 split, similar to that of Composition 1; and the coating of Composition 6 completely peeled off with the tape. The tapes on the coatings of Compositions 5 and 7 separated cleanly from the coatings without removing any significant amounts of the coatings.

The second samples of each of the coated surfaces were then tested for solvent resistance. In this test, each sample was placed in a closed container with 500 milliliters of lacquer solvent and the containers were tumbled for one hour at room temperature. The containers were opened, the color of the solvent was observed and each sample was inspected to determine the condition of its coating.

All of the samples failed this test, except for the coating of composition 7 which contained the polyethylene powder. The solvent from the testing of the sample coated with composition 7 was clear with no grey or black coloration and free of any flakes or particles of the coating.

The solvents from all the other samples were black in color and contained flakes of the coatings. The inspection of the coatings revealed that the coatings of Composition Nos. 2 (polyvinyl chloride) and 6 (polystyrene) were completely removed and the polyethylene surfaces of these samples were as white as the uncoated surfaces of the molded polyethylene test cubes. The coatings of Compositions 1 (polyisobutylene) and 4 (polybutene) were light to medium grey coloration, indicating that most of the coatings had dissolved in the solvent. The coating of Composition 3 (styrene-butadiene rubber) was a dark grey color, however, the coating completely separated from the polyethylene surface when rubbed with a cloth. The coating of Composition 5 (poly ethylene-vinyl acetate) was etched by the solvent.

The peel and solvent resistances of the coating from Composition 7 evidence that the coating was incorporated by fusion into the surface of the molded polyethylene surface, whereas all the coatings from the other compositions did not fuse into the polyethylene surface.

For several years I have worked on formulation of various compositions

suitable for use in the invention and I have attempted to use polyolefins other than polyethylene for application to the surfaces of molded polyethylene articles. Only compositions containing polyethylene powders have been found to be universally adaptable to yield coatings which fuse into the surface of a molded polyethylene article and which consistently pass the inspections of peel and solvent resistance described in this declaration.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable be fine or imprisonment, or both, under Section 1001 of Title of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent resulting therefrom.

Declared at Clarkdale, Arizona this 9th day of September, 2003.

R. Alan Reeves

R. Alan Reeves